

REMARKS

Claims 1-3, 6-10, and 25-38 are currently pending in the present application. Applicant respectfully requests favorable reconsideration in view of the remarks presented herein below.

In paragraph 4 of the Office Action ("Action"), the Examiner rejects claims 1-3, 6-11 and 24-36 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Abbasi et al., "Reliable Classification of Chrysanthemum Leaves through Curvature Scale Space" ("Abbasi") in view of Mokhtarian et al., "Robust and Efficient Shape Indexing through Curvature Scale Space" ("Mokhtarian"). Applicant respectfully traverses this rejection.

In order to support a rejection under 35 U.S.C. § 103, the Examiner must establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some motivation to combine/modify the cited references. Second, there must be a reasonable expectation of success. Finally, the combination must teach each and every claimed element. In the present case, claims 1-3, 6-11 and 24-36 are not rendered unpatentable over the combination of Abbasi and Mokhtarian because the Examiner fails to establish a *prima facie* case of obviousness as discussed below.

Independent claim 1 defines a method of representing an object appearing in a still or video image. The method includes, *inter alia*, deriving a curvature scale space (CSS) representation of the object outline by smoothing the object outline, deriving at least one additional parameter reflecting the shape or mass distribution of a smoothed

version of the original object outline, and associating the CSS representation and said at least one additional parameter as a shape descriptor of the object, wherein said at least one additional parameter corresponds to the eccentricity of said smoothed version of the original object outline.

Abbasi discloses a method for semi-automatic classification of 2D shapes based on their curvature scale space (CSS) image representation. According to the method of Abbasi, each object is represented by the maxima of the curvature zero-crossing contours of its CSS image. Then the similarity between two different shapes is expressed by a real value which is the result of comparing their CSS image representations. In addition, Abbasi discloses that eccentricity, circularity and aspect ratio of the CSS image are suitable global parameters. However, Abbasi fails to disclose or suggest deriving the eccentricity of the *smoothed* version of the original object outline as claimed.

Mokhtarian discloses a method of indexing images to retrieve similar images based on their associated vectors. The method of Mokhtarian utilizes the maxima of curvature zero-crossing contours of the curvature scale space image of an object as a feature vector to represent the shapes of object boundary contours. In addition, Mokhtarian discloses the use of the aspect ratio of the CSS image as a parameter which can be used for indexing in conjunction with other parameters like eccentricity and circularity. However, Mokhtarian, like Abbasi, fails to disclose or suggest deriving the eccentricity of the smoothed version of the original object outline as claimed.

In response to Applicant's arguments, the Examiner asserts the combination of Abbasi and Mokhtarian discloses deriving the eccentricity of the smoother version of the original object outline inasmuch as Abbasi discloses that eccentricity, circularity and aspect ratio of the CSS image are suitable global parameters, as they are scale and orientation invariant. To support this assertion, the Examiner points to paragraph 5, beginning on page 290, of Abbasi. This assertion is unfounded for the following reason.

Although Abbasi discloses that eccentricity is a suitable global parameter, nowhere in Abbasi is there any disclosure or suggestion of deriving the eccentricity of the *smoothed* version of the object outline as claimed. It appears that the Examiner is misinterpreting the text in paragraph 5. The first sentence of paragraph 5 states "[e]ccentricity, circularity and aspect ratio of the CSS image are suitable global parameters, as they are scale orientation invariant." The Examiner appears to be interpreting this sentence to mean eccentricity of the CSS image, circularity of the CSS image, and aspect ratio of the CSS image. However, as further indicated by the bold headings in Abbasi, the phrase "of the CSS image" refers only to the aspect ratio. See, specifically, the middle of page 291. Accordingly, one skilled in the art would interpret Abbasi as disclosing the known concept of eccentricity which refers to the original image, not the smoothed version. See the discussion on pages 3 and 4 of the present application, which discusses the conventional use of eccentricity.

Since Abbasi and Mokhtarian both fail to disclose or suggest a method of representing an object that includes deriving the eccentricity of the smoothed version of

the original object outline as claimed, the combination of these two references cannot possibly disclose or suggest said element. Therefore, even if one skilled in the art were motivated to combine Abbasi and Mokhtarian, which Applicant does not concede, the combination would still fail to render claim 1 unpatentable because the combination fails to disclose each and every claimed element.

Independent claim 10 defines a control device for representing an object appearing in an image. The device includes, *inter alia*, a controller configured to deriving the eccentricity of a smoothed version of the original object outline. Accordingly, independent claim 10 is patentable over the combination of Abbasi and Mokhtarian because the combination fails to disclose deriving the eccentricity of a smoothed version of the original object outline as claimed. (See discussion above with respect to claim 1.)

Independent claims 28, 31 and 32 each define a method of representing an object appearing in an image. The method includes, *inter alia*, determining a curvature scale space representation for an object outline to generate a plurality of curves representative of said outline, and determining characteristics associated with the outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of a smoother version of the outline to generate a shape descriptor for the outline. Accordingly, independent claims 28, 31, and 32 are patentable over the combination of Abbasi and Mokhtarian because the combination fails to disclose or suggest determining the eccentricity of a smoother version of the outline to generate a

shape descriptor for the outline as claimed. (See discussion above with respect to claim 1.)

Independent claim 33 defines a method for propagating a signal. The method includes, *inter alia*, generating a signal including a plurality of video images wherein said images include a plurality of objects having outlines, and encoding said objects onto said signal using a description language to define at least a shape descriptor generated using a curvature scale space representation for an object outline, including a plurality of fields, for at least one selected object wherein said plurality of fields include a field representing the eccentricity of a smoothed version of said outline. Accordingly, independent claim 33 is patentable over the combination of Abbasi and Mokhtarian because the combination fails to disclose or suggest a field representing the eccentricity of a smoothed version of the outline as claimed.

Independent claims 34 and 35 define a system for recovering or representing an outline of an object. The system includes, *inter alia*, a controller configured to determine characteristics associated with the outline including peaks and associated peak coordinates for a plurality of curves and the eccentricity of a smoothed version of the outline to generate a shape descriptor for said outline. Accordingly, independent claims 34 and 35 are patentable over Abbasi and Mokhtarian because the combination fails to disclose or suggest determining the eccentricity of a smoothed version of the outline to generate a shape descriptor for said outline as claimed.

Independent claim 36 discloses a machine-readable medium having stored thereon a plurality of executable instructions. The instructions include, *inter alia*, determining characteristics associated with the outline including peaks and associated peak coordinates for a plurality of curves and the eccentricity of a smoothed version of the outline to generate a shape descriptor for said outline. Accordingly, independent claim 36 is patentable over Abbasi and Mokhtarian because the combination fails to disclose or suggest determining the eccentricity of a smoothed version of the outline to generate a shape descriptor for said outline as claimed.

Claims 2, 3, 6-9, 25-27, 29 and 30 variously depend from independent claims 1, 10 and 28. Therefore, claims 2, 3, 6-9, 25-27, 29 and 30 are patentable over the combination of Abbasi and Mokhtarian for at least those reasons presented above with respect to claims 1, 10, and 28. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 1-3, 6-11, and 24-36 under 35 U.S.C. § 103(a).

The application is in condition for allowance. Notice of same is earnestly solicited. Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Penny Caudle (Reg. No. 46,607) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for

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any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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